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The Blind lead the
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THE BLIND LEAD THE BLIND

*Sightless People Perfect New Inventions for the Aid
of Their Fellow Unfortunates*

FRANCIS DICKIE

IN Paris there have just been brought to completion within a few weeks of each other three new inventions of an entirely new nature to aid the blind, a complete departure from anything previously produced, for the past has been devoted to the printing of books, magazines, newspapers and music in a special kind of type called Braille, which sightless people read with their finger tips.

The new inventions are widely varied in kind, from a pastime game, to an aid to education; and it was merely an odd coincidence that all three were brought to completion almost simultaneously. Two of them were perfected by blind men, a truly remarkable example of the "blind leading the blind," but not in the commonly used expression of the term, for the new inventions are of very great importance to people who have lost their sight. These inventions consist of a cross-word puzzle board for the blind; a new mathematical frame, with figures, letters and symbols used in the past by people who have the use of their eyes and now adapted to the use of the blind for learning simple and higher mathematics including logarithms and algebra; and a method by

which blind people can build their own radio sets.

In addition to these new inventions, an improved typewriter has been evolved for the blind and a high speed press to increase the rapid output of printed works for the blind. All these inventions have been thoroughly tested and approved at the headquarters of the American Braille press, seventy-four *rue Lauriston*, Paris, the greatest publishing center in the world for periodicals, books and music for the blind, which supplies forty countries, publishes nine periodicals and a hundred different volumes by the great writers of all countries.

But before describing here for the first time these new inventions and improvements on former methods in full and their particular application to the blind, it is best to give a brief review of the history of that great organization the Braille press, from the Paris headquarters of which twenty-two thousand blind people are supplied with reading matter in Europe alone and an almost equal number in the other parts of the world. For from a description of the organization and its work a better understanding can be grasped of the use and importance of the new inventions and also

See illustrations in photographic section

they doubt her physical health, and they have no confidence in her stability or fitness in great crises, either as a good counsellor or as an example of virtue and high character. My answer to Sylvanus and my message to my sis-

ters in America is that the companionate marriage has in it nothing but possibilities for evil. For the women of the United States the plan would bring pain more bitter than all the waters of Mara. Shun it like the plague."



"The companionate marriage would set back
the hands of time a thousand years

many things may be learned not generally known to the public.

Helping the blind to pass the time and to earn a living may fairly be said to be one of the greatest welfare works in the world. And so that some idea may be gained of the progress that has been made in very recent times, a short review of the history of the blind in former ages is included. For the civilian blind of to-day and those blinded in the World war, though robbed of the sense perhaps most precious to man, are still a thousand times better off—indeed no words can fully express the improvement of their lot—than were the blind people in earlier times when they were the butt of ridicule, when their labor was cruelly exploited and they had no single pleasant thing to occupy them.

So much a part of our lives has the printed word become, that our modern civilization may almost be said to rest upon it. Yet it is only in very recent times that reading has been made easily accessible to large numbers of the blind the world over, some twenty-two thousand in Europe and a slightly lesser number in North America, a very great decrease in number according to population compared with earlier times in Europe.

Little was done to help the blind in ancient times. The outstanding exception is Louis the ninth, well named "Saint Louis" if only for his help to the sightless. This renowned French king founded in Paris the first institution of modern times to help the blind in the year 1260. It was called the *Quinze-Vingts* and was established to succor three hundred soldiers who had lost their sight in the Crusade. This famous institution is

still in existence and administered by the Minister of the Interior.

The loss of sight in war was common long before the modern horrible methods of fighting were invented. It was particularly prevalent during the Napoleonic wars, though the cause was not fighting but chiefly the disease, trachoma. In Napoleon's Egyptian campaign seventy-two thousand men were partially affected. In the following twenty years all the European armies had contracted the disease, so that the total of the blind numbered fifty thousand people.

But after the death of the good king "Saint" Louis, the cause of the blind was neglected in Europe and for five centuries the lot of sightless people was pitiable, most of them earning a living by begging.

The annual fair of Saint Ovid in Paris as late as the year 1771 is an example of the position of the blind. One of the attractions of the fair was a group of blind men dressed in a manner to make them as grotesque as possible. They were decorated with enormous artificial asses' ears, peacock tails and cardboard spectacles without crystals. They gave a burlesque concert which was greeted with jeers and howls of cruel laughter. Yet out of this scene of human unkindness came a great good. For a witness of the outrageous performance was Valentine Haüy, a kindly man of some little means. He left the scene in sorrow, striving to think out some scheme to help sightless people.

"I will teach them to read," he presently told some of his friends. But he was faced with the problem of how to do this. Then again, just as his chance witnessing the blind men at

the fair of Saint Ovid had moved him to act, fate took a hand to aid him. In keeping with his desire to help the blind, Haüy a short time after the fair of Saint Ovid came upon a blind boy begging in front of the old church of *Saint Germain-des-Pres*. He took him home and began teaching him the letters of the alphabet with large raised type, hoping that some method of finger tip reading could be developed. About a week after the boy's taking up his residence, a chance happening to him revealed to Haüy the method which he sought, an event just as strange as the falling apple which brought to Newton the idea of gravitation.

The blind boy's name was Lesueur. One of his duties was to sort the papers of Haüy. In doing this he happened to touch a printed card where the type had impressed the paper so heavily as to raise the letters on the cardboard. At once the boy's sensitive fingers recognized the letters with which he had become familiar by handling the larger and heavier type. He showed his discovery to Haüy and from this beginning resulted the raised "point" on paper which was the foundation of the Braille printing of to-day. Haüy began printing books in raised characters for the first time in history in 1785. He gathered other blind youths about him and in that year, fourteen years after his beginning, he established the first school for the blind, The National Institute For Young People, which is to-day one of the chief French organizations to aid the blind.

In spite of Haüy's discovery his method known as "line types" was cumbersome and for fifty years little

progress was made in printing so it could be made easily available to great numbers of the blind. At the beginning of the nineteenth century a French army captain, Charles Barbier, worked out the method of dots to simplify Haüy's method. But not until 1834 was the importance of this step recognized and the method brought to perfection. This was due to the work of a blind man and is the second instance in the evolution of printing for the blind where the blind led the blind to better things. This blind man was Louis Braille, born at Coupvray, France, in 1809. He became blind at three years of age and was sent to Haüy's institute in Paris where twenty years later he became a professor and invented a new system based on Barbier's dots, which is the system used to-day.

II

Progress in supplying printed words to the blind has been steady but very slow until ten years ago when the establishing of headquarters in Paris at seventy-four *rue Lauriston* revolutionized the work and this plant is now the best equipped in the world to turn out large quantities of music, newspapers, books, magazines in a short time. To-day from these headquarters nine periodicals are issued in six languages:

The Courrier Braille, semi-weekly in French containing the same material as a newspaper; *The Braille Monthly* in French, a popular magazine made up of selections from all French periodicals; *The Inter-Allied Braille Magazine*, in English, monthly; and *The Condensed English and American Mag-*

azine, containing articles selected from leading magazines. These two are distributed to England, United States, Canada, Africa and New Zealand. *The Braille Ova-Riania* is a monthly in Serbian; *The Revista*, a monthly in Roumanian; *The Progresso*, a monthly in Italian; *The Courier Literature and Musical*, in French, dealing solely with books and music is very popular with the better educated French people.

In the last four years nineteen million pages of Braille reading matter have been produced at the Paris plant which supplied one hundred and eighty libraries in forty countries. There are seventy-five distributing centers in the United States and Canada. In the manufacture of this amount of matter one hundred and eighty tons of paper were used and fifteen tons of zinc. Fortunately the zinc after being used can be melted and used again, effecting a considerable saving.

Oddly enough, though the headquarters of this great welfare work are in Paris, the funds which carry on the work have been chiefly donations from the United States; and the immense progress made in the last ten years is largely due to American initiative. The founder of the Braille press is William Nelson Cromwell, a lawyer of New York. At the end of the war he conceived the idea of establishing in Paris a model printing house to be devoted exclusively to the printing and distributing of reading matter for the use of soldiers and sailors who had become blind serving on the Allied side during the World war. He not only mapped out the whole plan for the plant adapted to large scale production, but personally attended to the

setting up of the establishment in Paris and since its beginning has devoted most of his time to aiding the war and civilian blind.

Material to be used in the various periodicals is selected by the foreign secretary, Mr. George L. Raverat, from the leading magazines in English and French, hundreds of articles and stories being carefully examined monthly and a choice made of material most likely to appeal to sightless people. Care is always taken to publish nothing touching on the affliction of blindness. An example of the wide variety of material used can be judged by quoting the selections recently made for the two magazines published in English:

Wobbly Talk, by Stewart H. Holbrook, *American Mercury*; *When The Caribou Failed*, by Captain Mallett, *Atlantic Monthly*; *Bird Banding*, by E. W. Nelson, *National Geographic Magazine*; *Mikimoto and the Culture Pearl*, by Professor Starr Jordan, *Scientific American*; *Marriage To-day and To-morrow*, by Havelock Ellis, *Forum*; *Voodoo*, by John W. Vandercook, *Harper's*.

The secretary also passes upon the new books to be published. There are four volumes printed in Serbian; four in Roumanian; ten in Polish; a hundred in French by leading writers, among some of whom are Anatole France, J. H. Fabre, Loti and Bourget. Florence L. Barclay's *Rosary*, Oliver Curwood's *The Golden Snare*, Stevenson's *Treasure Island* and Bulwer Lytton's *Last Days of Pompeii* are some of the English books translated into French Braille. There are twenty-six titles published for English readers, some of the books being

William Beebe's *Galapos World's End*, O'Brien's *White Shadows In The South Seas*, Conrad's *The Rover*, Kipling's *The Brushwood Boy*, Mason's *The Four Feathers*. The greatest single work is *The Three Musketeers* which required ten volumes in Braille. Reymont Ladislas', *The Peasants*, a series of four books in ordinary print, is published in thirteen volumes in Braille. The greatest single publishing achievement of the press has just been completed by the issuing of the French *Larousse* encyclopaedia in twenty-two volumes. Seven hundred blind people have already been given sets of this.

In addition to reading matter, seven hundred thousand pages of music have been put out by the press to date, for it must be remembered that music is an occupation open to the blind. This is particularly true in France where a large number of men and women entirely support themselves by their earnings in various branches of music. Popular songs and jazzy pieces are produced in large quantities now; but the principal demand remains for work by standard composers as Brahms, Grieg, Mozart, Chopin, Mascagni and the like.

Many humorous incidents occur to the foreign secretary of such an institution. To the majority of the twenty-two thousand blind in France who have had dealings with the American Braille press, Mr. Raverat's name is known and he has become a sort of clearing house, so to speak, for their needs and troubles. Blind people living in the city come to him for advice, those in the country write. Often a blind man writes from a little province town asking the secretary's aid in find-

ing him a wife. Men about to get married send their savings to him with requests that he select dresses, hats and household necessities for their wives. Blind girls request him to purchase something stylish for them to wear. Many other matters of a more personal nature are placed before him. His position of clearing house demands much tact, sympathy, understanding, thought and consideration.

The building housing this great institution was formerly the ancestral home of the *Duc de Clermont Tonnerre* and his library now holds some of the reserve stock of Braille books. Here in this vast mansion, entirely renovated to fit the requirements of a big printing shop, the blind worker is seen in a new aspect—the blind working for the blind.

Practically the entire staff of fifty employees is blind. Yet they successfully operate complicated machinery. In one big room are the only motor-driven stereotype machines in the world which punch the dots on zinc plates on both sides. This very ingenious invention called Interpoint permits the printing of Braille on both sides of the paper, reducing the naturally bulky volumes to half their former thickness. The present books in Braille are thirteen and one-half inches high by ten and one-half inches wide and contain an average of one hundred pages.

When a book or article is to be set up in Braille a person of normal sight reads the text into an Ediphone. The impressed cylinders from this are transferred to the composing room and distributed to half a dozen reproducing dictaphones. These have headpieces which the blind operators

of the stereotype machines put on. The dictaphones work or stop at their bidding so repetition of text can be had if necessary. With the dictaphone going at one side the blind operator sits down to work at the stereotype machine. This machine has a keyboard by which are transferred to plates of zinc, by means of punches, all the dots which constitute the Braille writing. Each of these sheets of zinc makes a page of print. Before the transferring of the zinc dots to paper it is necessary that these sheets of zinc should be proof read. This is done by blind workers. The mistakes on the zinc are either blotted out with a small hammer or, if new dots are needed, these are made with a small two-pointed steel instrument.

Braille is set in three grades: simple or fully spelled, slightly contracted or very much abbreviated for experienced readers.

The stereotyped zinc plates are then sent to the printing room and put upon a press. A new high speed one has just been invented and will later herein be more fully described.

The printed sheets go to a stitching machine, after which they are bound by hand in a strong imitation leather binding.

III

This, in brief, is the history to date of welfare work in aid of the blind, the outstanding feature of which is the participation of the blind in helping their kind.

This is very strikingly apparent in the case of two of the new inventions, three of which have just been brought to completion in Paris. As noted

at the beginning of this article these inventions are an entire departure from the past which was devoted to the improving methods of printing.

The invention of a cross-word puzzle for the blind will perhaps be of greatest interest to the average reader in view of the fact that such puzzles have proved so fascinating to people gifted with sight. It was perfected by a blind French musician, Morris Anceaux, thirty years of age, living near Paris. The first cross-word puzzle put out by him was of brass, rimmed with wood to raise the brass a little. The brass was hand-drilled with holes to hold large-headed short nails with which the blind could form the words and which they could easily feel. It cost, however, three dollars and twenty cents to produce. As the American Braille press supplies free, or at less than cost for those who care to pay, all their products, experiments were made to cut the cost of production on the new invention. This evolution is illustrated in the accompanying photograph. The second board, also of brass and wood, cost two dollars and forty cents. One of heavy zinc was then made but this still represented an outlay of one dollar and sixty cents because the holes had to be hand-drilled. Then the workman in charge of the machine shop had a bright idea. He took one of the stereotype machines, the points of which ordinarily only indent the zinc plates used in printing. By lengthening the points on the machine he perforated the zinc. Thus with quickness and machine labor the holes were cut in the thin zinc plate and a cross-word puzzle board turned out that was both cheap and very light. Furthermore, by leaving

a strip of zinc blank around the puzzle and turning this down after the holes were made, a rim was formed raising the surface so the little nails had a clear space beneath. The board finally produced has fifteen spaces each way, the standard size for cross-word puzzles.

Of far more importance perhaps, though not of such great general interest, is the invention of a mathematical board completed almost simultaneously with the cross-word puzzle. By this board simple and higher mathematics, including logarithms and algebra, can be worked out by a blind person using the ordinary figures, letters and mathematical signs. The immense significance of this requires some explanation to the layman: educators working with blind children long ago discovered that a normal blind child when studying alongside of children possessed of sight made faster progress than when studying alone or with other blind pupils. In the past, however, the chief difficulty was that the blind child worked with Braille which the teacher of ordinary children did not understand and the teacher could not demonstrate to the blind child some problem she was explaining on the blackboard to pupils who could see.

Now, with the perfection of this new invention to teach mathematics and algebra, the blind child can sit in a class with children who see, for the board is fitted with the same letters and figures and symbols as are ordinarily used. By a queer coincidence the inventor of this frame is also blind and has lost his left arm. He is Vlodzimierza Dolanskiego, a native of Lemberg, Poland. He lost his

sight and one arm in an accident some four years ago. At the time he was a piano player and painter. He gave these up and studied mathematics. To facilitate his labors he worked out the invention which is now shortly to be manufactured for hundreds of others. The invention is simple, effective, inexpensive. The letters, figures and signs are made of lead about an inch long. These fit upon a wooden frame with a series of grooved lines. The grooved frame fits into the lid of a little case. The lower part of this portable case is divided into compartments to hold the letters, numbers and signs. The case is of lightest wood and the letters being made of lead, the entire invention can be manufactured in quantities for about three dollars. Judged from the point of utility it will probably prove of more lasting good to the human race than cross-word puzzles, though perhaps not so quickly become a favorite.

Besides these new inventions an improved typewriter has just been put out. Earlier manufactured typewriters for the blind used a roller. The drawback of this was that in writing Braille if a mistake was made it could not be corrected unless discovered at the moment of making because rolling back the roller flattened out the dots, thus spoiling the entire line or lines. Braille requires much more space than ordinary typing, so it was important to use both sides of the paper. The old machines printed only on one side, the latest one prints both sides. Instead of a roller a frame is attached at right angles to the keyboard consisting of two metal bars with guiding spaces. The keys pass

over the frame. When the page is filled the frame is turned over and writing can be done on the other side between the lines of the original page. This is possible by reason of the spacing device.

Another improvement is that the motive power to move the keys is supplied by a heavy pendulum working on a strong cord which can never go out of order. This has been found to be an improvement on the spring in previous machines for the blind which occasionally went out of order, the springs in these machines being different from an ordinary typewriter due to the wide difference in construction.

The third of the new inventions is a radio set which the blind can set up for themselves at small cost. This invention was made possible by cooperation between French radio corporations and the American Braille press. The companies supplied a skeleton frame in which the dials have raised letters. The conveying of the information was the difficult problem which the Braille press overcame. Naturally, the instructions had to be more than just printed directions. So after much experimenting a whole complete diagram was worked out in relief. This could be followed by a blind person desirous of making his own set. With the diagram went also the regular full written instructions. The photograph gives a complete idea of how the diagrams have been worked out in Braille to aid the blind in wiring the frame and setting screws. The

frame shown in the picture has been wired by aid of the diagram.

The latest improvement to be installed at the Braille press is a "roto" Braille press. In the old-fashioned one the zinc plates were placed flat in an upright position. The paper before being printed had to be dampened by hand to get the best impression and this machine could only produce four thousand pages an hour. In the new press the plate is placed upon a roller. Each turn of the roller works automatically with a cutter which drops the finished page upon a holding table. The new press has an output of twelve thousand pages an hour and the paper is now heated by electricity which procures the same effect or rather a better effect than that formerly procured by dampening the paper by hand. This also does away with all the former hand labor and consequent loss of time.

It is, indeed, a far, far cry from that day in 1771 when Valentine Haüy made a vow to teach the blind to read. And in the last ten years most of the advances to help the blind have been made. Now with the best books printed in various languages (and other languages will soon be added), with weekly and monthly magazines and music, with cross-word puzzles and mathematical boards and radio sets that can be made at home, the lot of the blind is made a thousand times lighter than in olden days when their only means of gaining a living was by begging and they had no means of entertainment.

ADEQUATE SELF-EXPRESSION

THEODOSIA CROSSE

An article may be either practical and inspirational or merely theoretical. Knowing this, the author has purposely used actual occurrences—disguised by change of locality and the use of fictitious names to illustrate the following. Her desire is to acquaint our readers not only with theory but actuality and to remind them "What man has done man can do again."—Editor.

SELF-expression is analogous with life. Everything that breathes expresses self. Energy flowing through organism is fundamentally self-expression, in a restricted sense, because it is individualized action even though the organism may not be aware of self in the higher meaning of awareness. But self-expression as applied to human behaviorism is much more complex and far-reaching in effect than mere energy manifested through a lower organism. Self, that inexplicable phenomenon, of which we speak so glibly but know so little, will find expression continually even though hampered and limited in a thousand ways. Adequate self-expression, however, is not so universal and is the crying need of all time.

In fundamentals the world over human nature is much the same. The emotions throb and beat in the breasts of the civilized as well as the primitive. Sometimes they are subjected to more conventional ways which are only skin deep, while underneath they are ready to blaze forth in all their fury or glory as the case may be. The need of self-

expression is the most basic principle of nature. An interesting sketch by Zora Neale Hurston, a Negro woman, in *The World To-morrow* shows this cosmic urge in a vital way. Among various impressions she cites the effect of a jazz orchestra upon her emotions. She says it stirred in her a mad desire to revel in the abandonment of the jungle; to dance, to scream, to slay.

Thus the race consciousness shrieks for individualized expression—her color is apparent in her words. They throb with a primitive vigor that is exhilarating: "I am a dark rock surged upon and, overswept by a creamy sea, I am surged upon and overswept; but through it all I remain myself. When covered by the waters I am and the ebb must reveal me again." This epitomizes the meaning of self-expression. No amount of submerging can prevent the ultimate emergence of the I. It will be expressed in all places and under all conditions.

Again this writer says: "Sometimes I have no race; I am the eternal feminine with its string of beads," but best of all—"I have seen that the



WHAT IS COLOUR TO A BLIND MAN?

One of the most interesting and perhaps one might say baffling phases in the education of the blind is their faculty to unerringly select a colour with which to fringe the hammock just woven in an industrial class. From a rack where blue, red, and yellow warp is kept the pupil selects, at the bidding of the instructor, the shade with which to complete his product.

It has been a question with leading scientists as to whether colour for the blind man has a distinct vibration such as that of a musical tone; or perhaps a vibration reacting on the olfactory nerve; or whether it might be a super-developed sense of sub-conscious vision. This is a question which has been of intense interest for many years to those engaged in research along these lines of education.

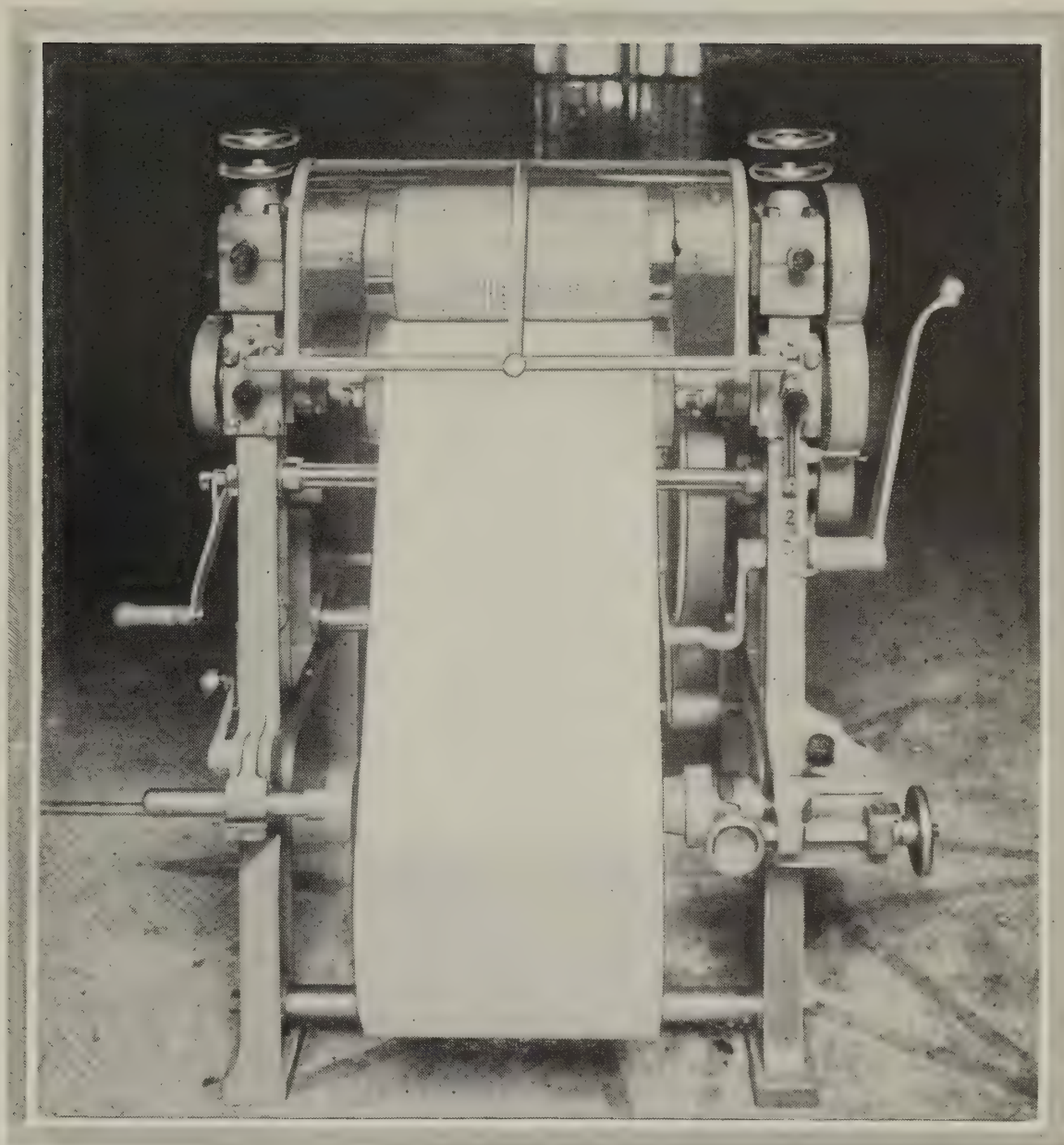


Reservestock of library books which are sent from the Paris Braille press to forty countries. They are printed in six languages.

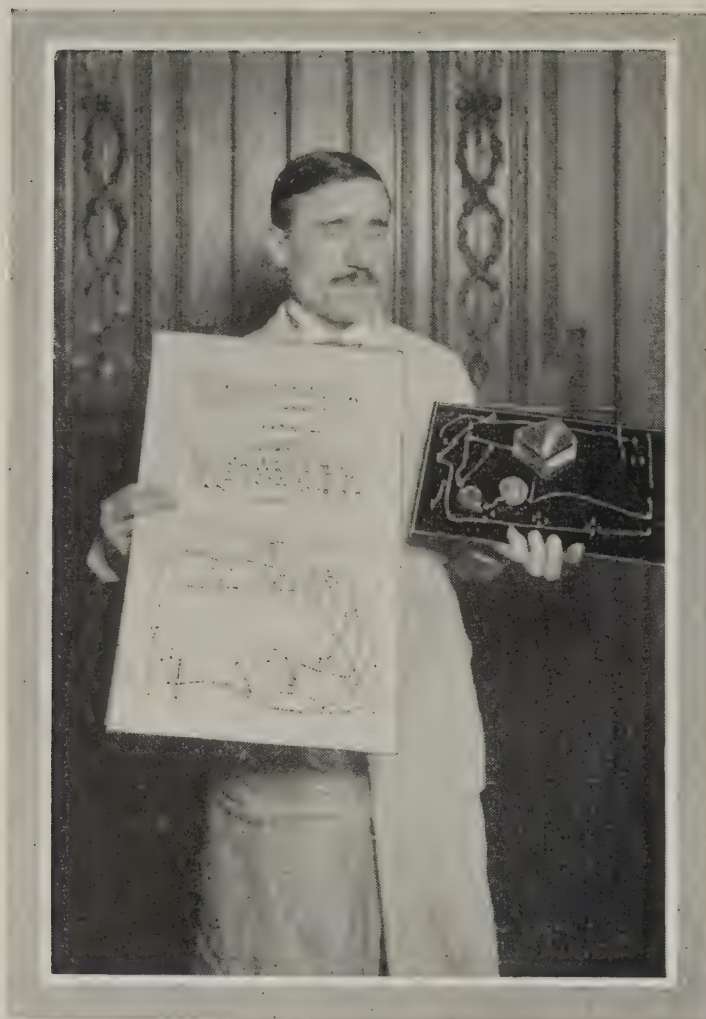


The students in the schools for the blind become expert in the location of the world countries. Raised, or Braille maps are used in the study of geography.

New high speed
roto press for Braille
printing recently in-
stalled at Paris
headquarters of the
American Braille
press. Its capacity
is twelve thousand
an hour.



This typewriter for the blind
has just been perfected in
Paris, and represents many
important improvements
over old models.



First photograph of diagram and skeleton from which the blind can make their own radio sets.

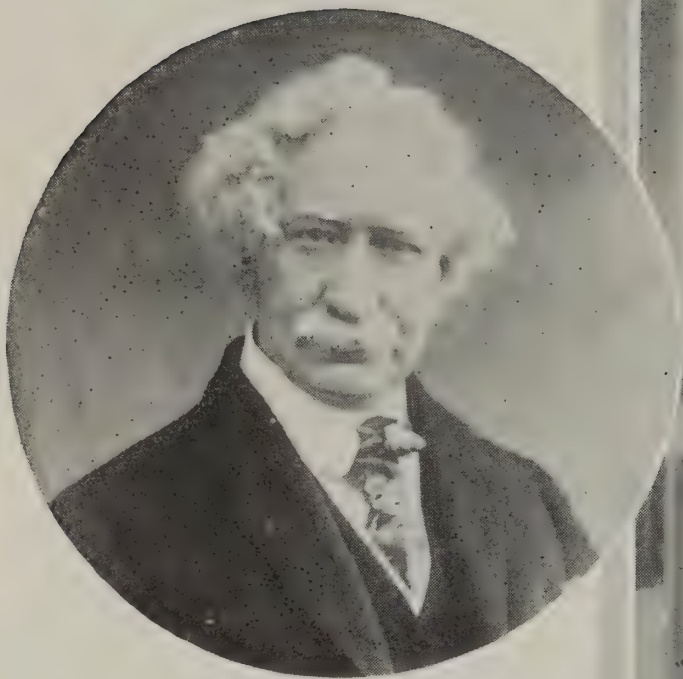


Blind operators operating stereotype machine from dictaphone dictation. One of the machines was adapted to punch out cross-word puzzle boards.

The sighted musician dictates to the maker of Braille music who in turn impresses the brass plates with delicate instruments made for this purpose. From the plates thus made is published the sheet music for the blind. This system, which has been generally adopted, was invented at the Illinois School for the Blind, located in Jacksonville.



One of the prime factors in the modern education of the blind is the training for livelihood. Blind boys and girls become efficient and reliable office employes.

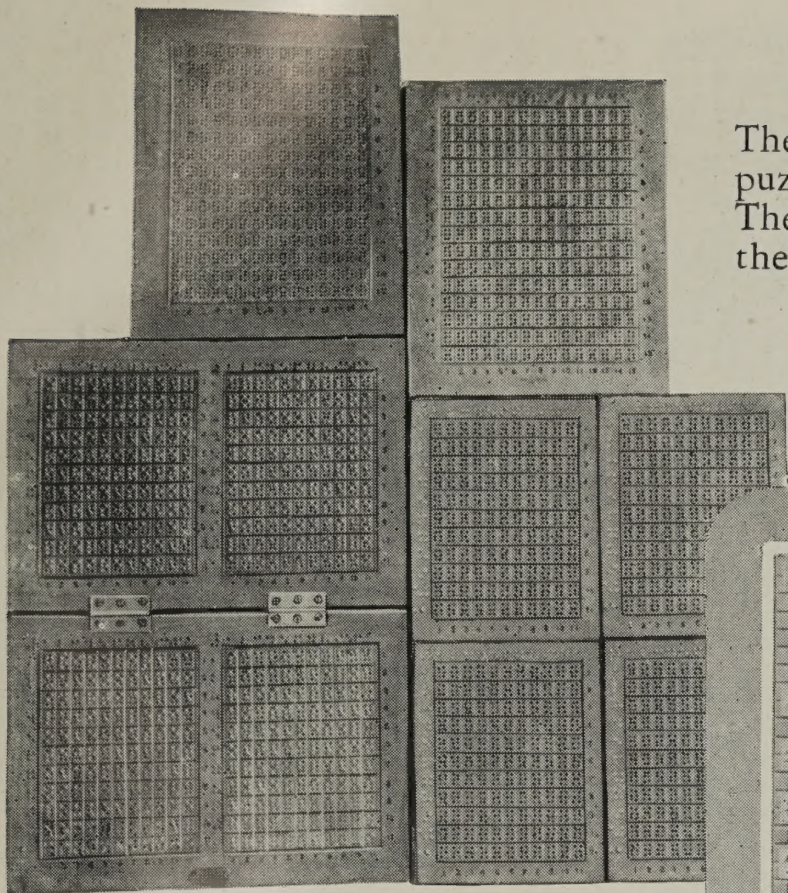


William Nelson Cromwell, New York lawyer, who founded the American Braille press for war and civilian blind in Paris.



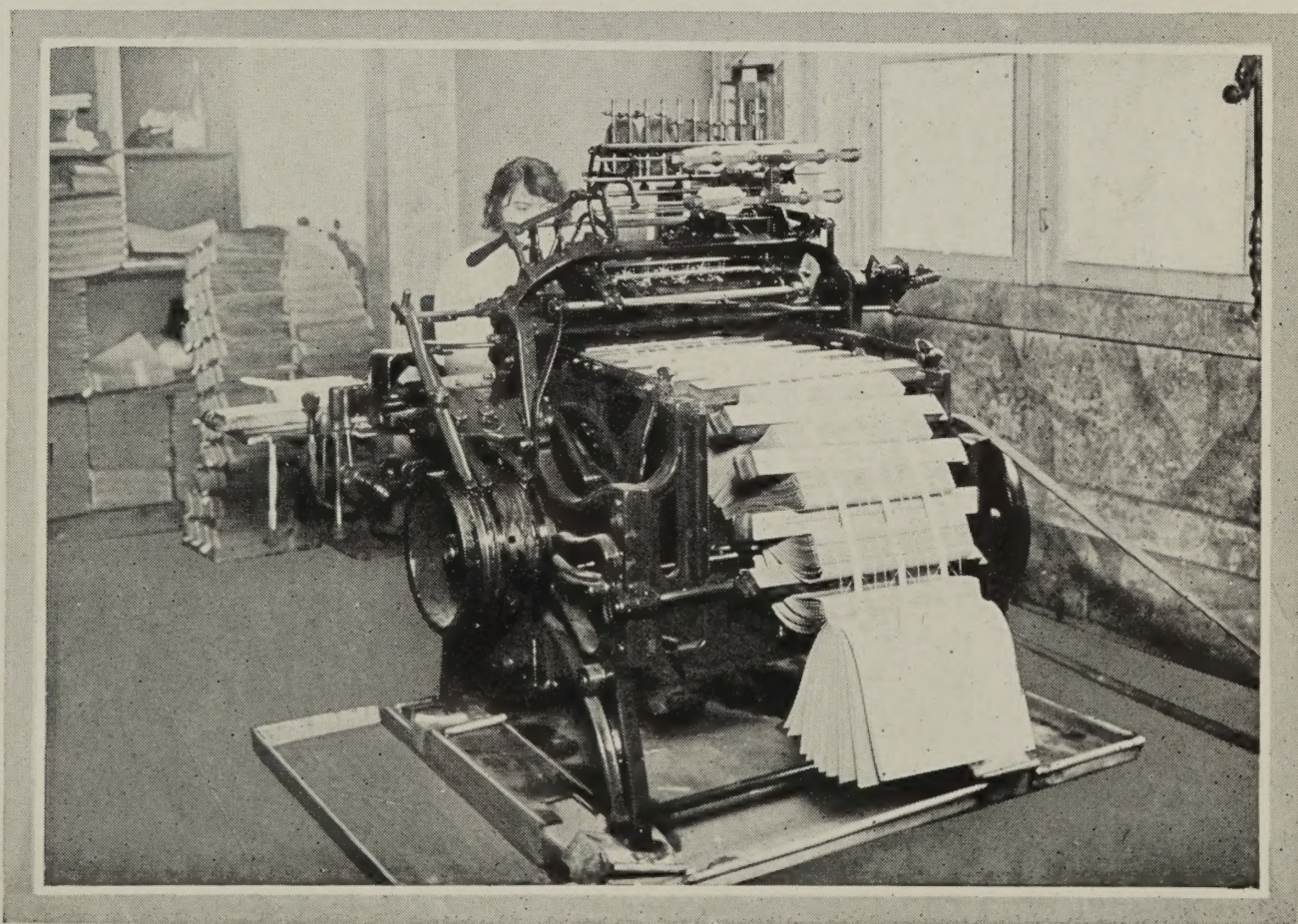
The blind child is taught to tell time at an early age. Most of the children become very skillful at this phase of sense perception—another evidence that any one of the so-called sense afflictions may be adjusted to normal living.

Notice the size of the Braille text books. Four such volumes make up one ordinary sized school book of the sighted child.



The blind now have their own cross-word puzzles, thanks to this new Paris invention. The four boards represent the stages of the invention, each type showing a reduction in cost from the former one.

This is the first instrument designed for teaching mathematics to the blind by the use of ordinary symbols.



The latest model stitching machine, turning out books for the blind. Until recently, this work was done by hand.



The blind child learns what objects look like by "the feel." Classes in sense perception give to the children an accurate idea of the structure of animals, flowers and every-day objects. This is evidenced by the fact that, using clay, the child makes faithful reproductions of the thing "sensed" as a part of his class work.



Practising a music lesson. The left hand is read with the right, the right with the left and each memorized. Then the two hands are practised together.

